DETAILED DESCRIPTION OF EMBODIMENTS

Other embodiments and modifications of the present invention may occur to those skilled in the art subsequent to a review of the information presented herein; these embodiments and modifications, equivalents thereof, substantial equivalents thereof, or similar equivalents thereof are also included within the scope of this invention.

In the description below, various details have been omitted, such as the operation of touch screen displays, in order not to obscure the description of embodiments disclosed herein. "Screen" refers for example to the hardware having a graphical "display" thereon.

FIG. **1** illustrates an overall construction of an embodiment of a multi-function printing device having a touch screen control display. The printing device, as illustrated in FIG. **1**, includes, for example, a scanning station **135**, a printing station **155**, and a finisher device **145**, which can be a sorter, tower mailbox, stapler, etc. The printing station **155** can include a plurality of paper trays **140** that store the paper used in the printing process. Lastly, the printing device can include a high capacity feeder **130**, which is capable of holding large amounts of paper stock to be used by the machine.

In addition, the printing device will often include a GUI **150**. The GUI **150** allows the user to control the various functions of the printing device by presenting various types of displays to the user which provides the user an opportunity to program certain job or function characteristics. In many devices, the GUI **150** is touch sensitive. It is generally difficult for visually impaired persons to use a touch sensitive screen without assistance.

FIG. **2** illustrates an example of a touch sensitive screen **10** with a GUI display exhibited thereon. The display image **12** is taken specifically from a Document Centre 265ST machine. This display **12** is meant to be exemplary and the embodiments described herein, while mainly relating to scanning and printing functions, are intended to be used in any situation where a user contends with GUIs, and especially touch sensitive screens. The display **12** on the screen **10** includes access to multiple features including selectable features.

"Feature" can refer to any visual object that makes up a portion of a video display. A "selectable feature" is one that causes something to happen when selected by the user. Selectable features can take the forms of, for example, tabs, buttons, bars, etc.

The display **12** illustrated in FIG. **2** includes a variety of selectable features such as four tabs, nineteen rectangular bars, and one button that a user can tap to alter the output of a print or copy job. A non-visually-impaired person simply taps the screen where a desired feature is located to change one or more settings for a print, copy, or scan job. A visually impaired person would find it difficult, if not impossible, to operate a printing device, copying device, or scanning device with a touch screen interface such as that disclosed in FIG. **2**.

FIG. **3** illustrates an embodiment of an overlay **14** for the display **12** shown in FIG. **2**. In embodiments, such as the embodiment shown in FIG. **3**, the overlay is substantially transparent. In embodiments, the overlay **14** includes tactilely readable areas **16** located at positions corresponding to the positions of the selectable features in FIG. **2**. In embodiments, these tactilely readable areas **16** take the form of raised protrusions. The raised protrusions **16** will typically identify the feature on the display **12** that resides immediately beneath the protrusions. The protrusions **16** may also convey additional information to the user. For example, the protrusions can describe the function of a feature. FIG. **4** illustrates the overlay **14** in place over the touch sensitive screen **10**.

In embodiments, such as that shown in FIG. **3**, the raised protrusions take the form of Braille characters. However, the raised protrusions do not have to be Braille characters. The only requirement is that the user has to understand the information conveyed by the raised protrusions. The raised protrusions could be, for example, an alternative alphabet or a set of specific symbols associated with a device that the user could be trained to recognize.

In embodiments, the overlay **14** can include a tactilely readable identifying mark or label **15** as shown in FIGS. **3** and **4**. The label would inform the user that the overlay **14** corresponds to the display **12** shown in FIG. **2**. Each overlay for a device would have a label indicating the display to which it corresponds.

In embodiments, the overlays can be used in the manner outlined in the flow chart of FIG. **5**. The operator first approaches a device having a touch screen interface. In embodiments, the machine can be equipped with a hard reset button (not shown) that resets the display to an initial or start up configuration. The reset button can have a tactilely readable identification on or near it to identify it as such. If the user is unsure whether the device is set to the start up display, he can simply depress the reset button to return the screen to the start up display. The operator then selects the first overlay corresponding to, for example, an initial or start-up display on the screen. The first overlay will typically be chosen from a set that is positioned either on or near the device. The overlays can be numerically coded near a corner for easy identification. The operator then places the first overlay on the touch screen, where it can be held in place by one of a variety of methods, such as a simple press fit. The user reads the overlay and determines the location of the feature or features that he wishes to press. The user then selects the feature or features on the display (typically by pressing the feature through the overlay). Selecting a feature often causes a new display to appear on screen or, alternatively, modifies the existing display so that some features are removed or others are added, thereby requiring the user to switch the overlay for a new one. The device typically provides a signal when the display changes and the user is required to change overlays. The operator then proceeds to remove the first overlay and places a second overlay on the screen corresponding to the particular signal received from the device. The overlays can continue to be changed as required until a task is completed.

In embodiments, the signal will comprise audible feedback. Audible feedback can be provided either through a series of beeps, i.e. 2 beeps indicates proceed to next overlay, or a voice command can instruct the operator which overlay to use next. The overlays would either be kept stacked in order or the user would read the label to find which overlay to use next. In embodiments, the labels could simply read one, two, three, etc. The user would select the overlay labeled "two" when he heard the prompt. Alternatively, each particular overlay can be related to a particular corresponding audible prompt. For example, if the overlays are individually numbered, a particular pattern of beeps could correspond to a particular overlay. For example, the user would select overlay four when the audible prompt consisted of four beeps.

In embodiments, a single overlay can be used with multiple displays. In situations where multiple displays have at least some features located in the same position, the